Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Proposals to Develop and Manage an	)	DA 04-672
Independent Database of Site Registrations	)	
By Licensees in the 71-76 GHz, 81-86 GHz	)	WT Docket No. 02-146
and 92-95 GHz Bands	)	
	)	

COMSEARCH PROPOSAL TO DEVELOP AND MANAGE A DATABASE OF SITE REGISTRATIONS IN THE 71-76 GHz, 81 – 86 GHz AND 92-95 GHz BANDS

Comsearch, in response to the above-referenced public notice from the Wireless Telecommunications Bureau ("WTB") issued March 12, 2004, hereby submits a proposal to develop and manage an independent database of site/link registrations by FCC licensees in the 71 – 76 GHz, 81 – 86 GHz and 92 – 95 GHz bands.

1. Comsearch Background

Comsearch is a division of Andrew Corporation. Over 67 years old, Andrew Corporation employs more than 7,000 employees and is an S&P 500 company traded on the NASDAQ National Market System under the symbol ANDW. Comsearch, headquartered in Ashburn, Virginia is an engineering firm specializing in spectrum management of terrestrial microwave, satellite and mobile telecommunications systems. Comsearch interacts with the Commission and the National Telecommunications and

Information Administration (NTIA) and actively participates in various industry groups such as the National Spectrum Managers Association (NSMA), the Telecommunications Industry Association (TIA), Institute of Electrical and Electronics Engineers (IEEE), and the Wireless Communications Association International (WCA) to develop rules, industry recommendations, and standards to promote the efficient use of the radio spectrum. Since 1977, Comsearch has been a leading provider of engineering services and software for mobile, microwave and satellite communications systems, both domestically and internationally. In this role, we have gained extensive experience in developing industry-standard coordination processes, developing and maintaining state-of-the-art software and databases, performing interference analyses of complex environments, and understanding regulatory requirements.

Comsearch has been actively involved in this proceeding since its inception. We are members of the WCA 60+ GHz committee ("Committee") established to develop industry consensus regarding the appropriate spectrum allocations, band plans, regulatory framework, and technical operating standards for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. The Committee's overriding goal is to achieve the objectives of the Commission's spectrum policies, *i.e.*, to encourage innovative uses of the spectrum, accommodate future developments in technology and equipment, promote competition in communications services, equipment and related markets, and permit equitable sharing between non-Federal Government and Federal Government systems. Comsearch contributed significantly to the Committee's efforts to develop an appropriate link analysis regime.

The result of these efforts was the development of a comprehensive engineering and process document titled "Path Coordination Guide for the 71 – 76 and 81 – 86 GHz Millimeter Wave Bands."[1] Based upon our extensive spectrum management experience, our ongoing interaction with industry stakeholders and our intimate knowledge of the issues surrounding the 70 – 90 GHz bands, Comsearch is uniquely qualified to perform all of the duties and responsibilities as outlined in the Public Notice ("Notice") and we hereby propose to become a commercial database manager for the 71 – 76 GHz, 81 – 86 GHz, and 92 – 95 GHz bands.

2. Software and Database Experience

Comsearch has developed numerous software products to address the engineering challenges of network planning, spectrum sharing, and spectrum administration. Our software team is well versed in the latest programming techniques including Object Oriented Design (OOD), C, C++ and Java in Unix and NT environments, plus the development of Internet applications. We have extensive knowledge in database design and maintenance including Sybase, Oracle and Microsoft Access. We maintain a full-time staff of trained database technicians and our databases are recognized throughout the industry and by Commission staff as accurate and complete. The following are some of the Comsearch software and database products that support the wireless communications industry:

[1] Submitted by WCA as part of an ex parte presentation in Docket No. 02-146.

Interactive Solutions – For more than 27 years, we have developed and maintained over 200 programs in support of our domestic coordination and spectrum management services. Operating in a Unix environment, the software is written in Java, C and C++ and utilizes a Sybase relational database. Interactive Solutions provides interactive Internet access to a host of products that help the user design, engineer, maintain, and license a wireless network. The Comsearch.com web site allows access to our comprehensive microwave and satellite earth station databases, engineering analysis tools, and GIS related products.

ULS Express – Built in collaboration with the FCC, ULS Express is an online interactive FCC Form 601 filing system that significantly streamlines the application process by automatically populating over 90% of the application with prior coordination data and submitting the application directly to the FCC. It contains all of the same error checking and compliance routines found in the FCC's ULS. Hundreds of links can be submitted at once through a batch process. Through this effort we have developed an ongoing and productive rapport with Commission staff and their software and database support resources.

MAS Express –An interactive, web-based application that allows the user to quickly and easily identify and assess Multiple Address Service (MAS) spectrum availability, assign frequencies, and prepare documentation to obtain FCC licensing.

iQ•link® – A Unix based software tool designed to perform complex spectrum allocation and frequency engineering of Point-to-Point and Point-to-Multipoint systems. IQ.LINK has been used to engineer hundreds of thousands of systems at client locations in the United States, Europe, Latin America, and Asia. This application was developed using C, C++, Motif, XWindows and an Oracle database.

iQ•clear® – A Unix based platform that calculates the interference potential between PCS networks and 1.9 GHz microwave links and between future AWS networks and 2.1 GHz microwave links. Developed in C and C++, this product includes an extensive GIS layer for the graphical display of terrain, boundary, roadway, waterway, and demographic data.

3. Other Relevant Experience

UTAM Prime Frequency Coordinator - In 1995, the Commission designated UTAM, Inc. as the coordinator of Part 15 unlicensed devices in the 1910 – 1930 MHz band. UTAM in turn, selected Comsearch as their Prime Frequency Coordinator to

support UTAM's oversight of unlicensed device deployment in the 1.9 GHz band. In this role, Comsearch was responsible for the development of several databases to track, analyze and process Part 15 device deployments; establishment of coordination requirements specific to the low power, in-building, unlicensed devices; and consultation on the development and implementation of detailed interference criteria specific to that service. We continue to provide these services on an ongoing basis.

Wireless Medical Telemetry Service – In 2000, the Commission established the Wireless Medical Telemetry Service bands in response to growing concerns about interference from new digital television transmitters, low power television transmitters, and private land mobile radio equipment. The Commission subsequently designated the American Society for Healthcare Engineering (ASHE) of the American Hospital Association as the frequency coordinator to create and maintain a database of deployed WMTS systems. Comsearch was selected by ASHE as their technical partner in providing database management and frequency coordination services for WMTS. In choosing Comsearch, ASHE recognized Comsearch's expertise with spectrum management, including interference resolution and design of interactive web-based database and engineering tools. Comsearch provides a broad range of services to ASHE and its members including:

- Development of a device registration database
- Creation of a web-based front end to enter deployment data, perform frequency searches, and receive coordination results

- Ongoing administration of the system
- Customer support
- Coordination with the Radio Astronomy service
- Coordination with the NTIA for government radar

4. Database Manager Duties and Responsibilities

Comsearch is willing and able to perform all of the duties and responsibilities of the Database Manager found in the Notice and listed below. In each case we have included a statement of compliance and in some cases additional pertinent comments.

- ***Develop, manage and use a single link registration database—to be shared with all Database Managers if WTB selects more than one during this filing window or in the future—which will serve as a clearinghouse and repository of current and historical link information for all registered non-Federal Government links***

Comsearch is able and willing to work with other 70 – 90 GHz database managers should WTB decide to designate more than one. However, we believe it would be inefficient and impractical for multiple parties to share the database manager duties and responsibilities. We urge the Commission to select a single database manager for the following reasons.

First, the Notice specifies that the database manager(s) will be responsible for the development, management and use of a single link registration database.

The software development that will be necessary to address all of the requirements, capabilities and utilities found in the Notice will be extensive. Interjecting multiple database managers into the development process can only lead to delays, increased complexity and additional costs. Likewise, managing the various administrative responsibilities required cannot be accomplished effectively with multiple parties involved. This would be like having several entities developing, maintaining and administering the Universal Licensing System. A single database that is maintained and administered by a single entity is the most practical way to implement the duties and requirements outlined in the Notice. For instance, the requirement to time/date stamp registrations in order to provide first-in-time protection cannot be easily achieved in a multiple database/manager configuration. To implement a registration process that is near "instantaneous" and will include as a critical component a specific time/date stamp, will require that the registrations be processed through the software and database in an automated serial fashion. Trying to interface with multiple databases or database managers would only inject delays into this process and result in an overly complex situation.

Second, the frequency bands are not currently occupied and therefore do not present the need for more than one database manager to administer.

Development of equipment in these bands is in the early stages and a natural uncertainty exists in the marketplace as to how rapidly new registrations and deployments will occur. Therefore, until the number of registrations reaches a critical level and the Commission determines that a single database manager can no longer adequately administer the bands, we feel that the immediate designation of multiple database managers is unnecessary and impractical.[2] To assist the new industry link registration process in getting off the ground, the Commission should not unnecessarily increase the complexity and cost of the software development by selecting multiple database managers.

- ***Make all Database Manager services available to all parties on a first-come, first-served and non-discriminatory basis***

Comsearch will comply with this requirement.

- ***Ensure that non-Federal Government links are coordinated with Federal Government operations through NTIA's planned automated coordination mechanism, and promptly notify the licensee when a link submission receives a green- or yellow-light response from NTIA***

Comsearch will comply with this requirement. The NTIA is currently developing an automated coordination mechanism that will allow non-Federal Government users to quickly determine link clearance with Federal Government systems.

[2] We acknowledge and support the Commission's right to appoint additional database managers at any time as necessary.

Based upon our discussions with the NTIA, the initial version of the software is expected to operate as a stand-alone module. To further improve and streamline the registration process, we envision the development of an automated interface between the NTIA system and the commercial registration system. Instead of entering link data in both the NTIA and commercial applications, users would only need to enter the data in the commercial registration system. The commercial registration system would then automatically coordinate the data with the NTIA system.

- ***Verify that individual link registrations are compliant with Part 17 of our rules and, if required, properly registered on the Commission's Antenna Structure Registration Database***

Comsearch has already developed this capability in our ULS Express product and would reuse the existing code in the 70 – 90 GHz software.

- ***Update the link registration database based on FCC actions on ULS affecting licenses in these bands, such as registration deletion, or license expiration, renewal, transfer or assignment***

Comsearch will comply with the requirement. We currently perform daily downloads of site and link information from Commission databases, monitor public notices and update our records accordingly. Our staff of experienced database technicians is well-versed on Commission licensing actions.

- ***Add or delete link information to the database based upon review and processing of link submissions from licensees on a non-discriminatory, first-come, first-served basis***

Comsearch will comply with this requirement. We have extensive experience working within the first-come first-served Part 101 frequency coordination process.

- ***Withdraw unconstructed and deleted links from the database, modify the database when it is determined that a licensee has not met construction and loading requirements, and maintain documentation of such actions (with notice to WTB for links also registered in ULS)***

Comsearch will comply with this requirement. In the WCA Petition for Reconsideration, a proposed link construction requirement of 6 months is proposed rather than the 12 months adopted in the Report and Order (R&O).[3] We agree with the WCA that a shorter construction period is warranted given the compact nature and ease of installation of the 70 – 90 GHz radio systems and it will help to limit the potential warehousing of frequencies. Furthermore, the streamlined licensing process will significantly reduce the need for lead-time in planning and implementing links.

[3] WCA Petition for Reconsideration at p.11 and p. 2-A.

- ***Maintain a complete and accurate history of all links***

Comsearch currently performs this function for Part 101 links and has the experience to provide this for the 70 – 90 GHz bands.

- ***Administer the formal interference protection procedures, based upon "first-in-time" information recorded in the database***

Comsearch will comply with the Commission's proposed interference protection procedures described as follows in the R&O: Upon being notified of a case of harmful interference we will identify the conflicting link, determine first-in-time status between the links, and, if appropriate, notify the interfering link operator of the complaint.

However we strongly believe that a key element missing from the new rules but vital to success of the new service is a requirement for interference analysis as part of the link registration process. This "interference harmonization" step, necessary to provide assurance to users that their gigabit radio links will not be degraded or even interrupted by subsequent interference, will not place a significant additional burden or expense on users. State-of-the-art software and databases allow for near real-time analysis making this requirement virtually transparent to the user.

- ***Provide NTIA, FCC and all interested parties access to the database at all times***

Comsearch will comply with this requirement. While we are capable of providing this functionality, we would like to propose that the Commission consider the possibility of using the ULS to provide general public access to the licensed and registered data. The Commission has put considerable effort and resources into developing the capabilities of the ULS to allow for public access of FCC license data. The site is set up to handle thousands of inquiries daily and includes a number of search routines that are now very familiar to the industry. Instead of requiring the database manager to expend the time and resources to recreate this full capability in the third party software, the Commission could require a nightly upload of link data into ULS. This data upload would not obviate the basic requirements and duties of the Database Manager to manage and administer the device registration process and would not create additional burdens on Commission staff. Since some 70 – 90 GHz links must be licensed individually, we expect that ULS will already be set up to database this type of information[4]. A nightly upload from the registration database into ULS, simply the reverse of existing practice whereby ULS is downloaded daily into industry databases, would provide the Commission with a clean up-to-date record of device registrations.

[4] Users must submit FCC Form 601 to license links individually when the links require NTIA or international coordination, are located in a quiet zone, or require environmental assessment.

Having the data in ULS would provide the Commission and the public with familiar access to the data and the ability to perform data queries already found in ULS. The database manager registration database would remain the official database for registration purposes and could contain additional information such as links in progress and historical data.

- **E*stablish, at a minimum, the following report capabilities/utilities for NTIA and FCC:***
    - ***ability to query on basic link elements such as licensee name, FCC call sign, registration number, transmit coordinates and transmit frequency or frequency band;***
    - ***ability to query and retrieve all link registrations associated with a specific licensee or FCC call sign;***
    - ***ability to retrieve all link registrations within a specified geographic area;***
    - ***ability to retrieve all link registrations filed or accepted within a specified time period;***
    - ***ability to retrieve or request a report of all links removed or deleted from the database within a specified time period;***
    - ***provide automated interface or reports as required by NTIA to allow them to maintain an accurate and complete database;***

- ***upon request, a complete download of the registration database in a format specified by FCC;***
- ***ability to provide other reports to NTIA and FCC and respond to information requests as necessary;***

Comsearch databases and software have similar search capabilities and we will comply with this requirement. As discussed above, a regular upload of the link data into ULS would achieve much of the required functionality.

- ***Enter into a Memorandum of Understanding (MOU) with the United States Government memorializing its duties and responsibilities, and agreeing to serve a five-year term, which could be renewed by the Commission.***

Comsearch will comply with this requirement.

5. Security Measures

In the Notice, the Commission requests a description of security measures the applicant will take to safeguard database information, including off-site data back-up facilities and measures to ensure continuity of access to the database in the event its operations are interrupted. Comsearch currently has a number of security measures in place for its web-based software applications and we would propose similar measures for the 70 – 90 GHz database. Current security measures include:

- Full data back-ups are performed on a weekly basis with Quarterly and Annual Archives that are sent offsite for up to seven years.

- Between full data back-ups, additional data back-ups are performed on a nightly basis.
- Back-up tapes are picked up on a weekly basis and stored in a secure off-site facility
- Checkpoint Firewall System to protect the LAN from the Internet.
- Web-servers and Email Relays reside on two separate "DMZ zones" (Isolated Inbound Internet).
- Databases reside on a backend server within the internal high security zone.
- SSH Web Security certificates with 128-bit encryption.
- Limited access from external users through 3 DES Secure-Client VPN.
- Norton Antivirus software on file servers and PCs.
- Limited personnel access to secure Data Center via Card/Key with Alarms.
- Security Camera in Data Center.
- Facility has 24/7 staff onsite with automated remote environmental monitors.

The Comsearch Data Center has a 65 KVA uninterruptible power supply (UPS) with redundant air condition that assures continuity of operation during power outages. During times when Comsearch needs to perform periodic maintenance, the site would be unavailable. Prior notice of such planned outages is provided through emails and/or notices on the web site. There is typically a four-hour Security and Operating System update performed once a month.

6. Conflict of Interest

Comsearch does not intend to license or operate 70 – 90 GHz links nor to produce 70 – 90 GHz equipment nor to be involved with the sale or distribution of 70 – 90 GHz equipment. Thus we have no conflict of interest with potential 70 – 90 GHz licensees, equipment manufacturers or distributors. Comsearch commits that it will honor all requests from users to access and enter information into the database on a first-come first-served basis. Comsearch pledges that it will not discriminate among users, either in setting registration fees or providing service.

Comsearch currently maintains databases and provides spectrum management services for a multitude of competing interests. These include vendors, operators, and integrators selling competing products or services; state and local government; public safety and commercial providers as well as different technologies such as microwave and satellite vying for shared spectrum. We have found that a strict reliance upon the Commission's rules, industry recommendations and guidelines, and the use of good engineering practice helps to avoid conflicts of interest. Our experience has shown that direct spectrum management involvement can serve to better harmonize the use of the spectrum for all parties involved. Since access to the databases and software will be open and available on a first-come first-served basis and requests will be processed in an automated and serial fashion, the potential for conflict of interest is removed.

7. Optional Services

In the Notice, the Commission requests whether the database manager intends to offer additional services and specifically whether the database manager intends to provide frequency coordination services. The Commission's proposed registration process does not contemplate nor require traditional Part 101 prior frequency coordination and therefore we do not intend to provide this service. However, we are in agreement with the Petition for Reconsideration filed by the WCA that states that an up-front interference analysis should be an integral part of the registration process.[5] Depending upon how the Commission rules on the petition, we would either provide this interference analysis service as part of the registration process or as a separate option to those who would be interested. In addition, we have the ability to offer a host of support services that we currently provide for all microwave bands. These services include site and path surveys, interference troubleshoot and mitigation measurements, engineering consultation, and custom data and GIS products.

8. Time Table

Comsearch is willing to commence service promptly after being selected. We are currently able to provide Part 101 frequency coordination services during the interim period prior to implementation of a third party registration database.

[5] WCA Petition for Reconsideration at pp. 3 – 7.

The following is our proposed timetable for testing, demonstration and operational launch of the registration database. The registration system development will consist of five components: Requirements, Design, Development, Testing, and Launch.

Requirements - The purpose of this phase is to identify the business, technology, security, and data requirements in order to provide a clear definition of the scope and functionality of the complete system.

Design - During the design phase, Comsearch would identify the detailed design characteristics of the major system components. The design would define how the architecture, application, and database systems would be constructed to provide the functionality specified in the system requirements.

Development - The development phase includes creating databases, programming, developing content, and integrating systems.

Testing - Thorough application and infrastructure testing would be conducted at the end of the development phase.

Launch - Launch of the application begins after the system has been fully tested, demonstrated, and accepted. During this final phase, the application would be made available to the user community and Comsearch would provide ongoing customer and technical support.

Because detailed systems requirements have not been specified, and the scope of the project depends critically upon these requirements, we can only provide an approximate time frame for completion of the effort. Based upon our experience with similar projects, we believe that the tasks and deliverables that comprise this project could be completed in four to eight months.

9. Vision for 70 – 90 GHz Band Link Registration and Interference Harmonization

A flow chart included as Attachment 1 outlines our concept of the link registration process, including interaction among the third party database manager, FCC, and NTIA. In addition, the discussion below gives more detail on several aspects of the process.

- **Data Entry:** A login id and password to the registration database are assigned upon verification of an existing blanket license or a filed application for a blanket license. In addition, temporary or single-use login information could be provided for those wishing to check if a link could be registered prior to filing a blanket license application with the FCC. The user accesses the registration software to enter link parameters outlined in Appendix C of the R&O.

- **Interference Harmonization:** The software runs an automated interference analysis based upon §101.147 (z)(2) and the WCA Path Coordination Guide. If link data meets interference criteria, a date/time stamp is assigned. If the link data fails to meet the interference criteria, the user is given the ability to modify certain parameters or request assistance. This harmonization process continues until an operationally compatible (non-interference) solution is found. Because of the narrow antenna beamwidths and fixed nature of the service, numerous harmonization options exist. These include power reduction, cross-polarization, antenna changes, and antenna relocation and repositioning. In many cases, simply moving the antenna several yards to re-point or take advantage of natural blockage is all that will be necessary.

- **FCC 601 Requirement Checks**: For the categories listed in §101.1523(c), the software runs through a series of checks for the requirement to file individual link applications on FCC Form 601.
  - Environmental Assessment - user is prompted to check yes or no.
  - International Coordination – software implements §1.928(F) requirements for distance from the border based on antenna pointing azimuth, and identifies sites requiring international coordination
  - Quiet Zones – software automatically identifies sites located within the quiet zones listed in §1.924.

- Upon failing any of these checks, the link is flagged in the database and the user is instructed to file individual FCC Form 601 applications for the link.

- **Part 17 ASR Requirement Check:** The software checks each site for the requirement to register with the FCC's antenna structure registration database based on tower height above ground level and proximity to airports. If registration is required, the software determines if registration is on file with FCC. Upon failing this check, the link is flagged in the database and the user is instructed to file a FCC Form 854 registration for the site (and FAA Form 7460-1, if necessary).

- **NTIA Registration:** The link data are submitted to the NTIA web system via an automated interface. The NTIA software performs the necessary interference checks versus government links and RAS sites and assigns either a "green light" (approved) or "yellow light" (requires further study) status to the link. If the link is given a yellow light, the link is flagged in the database and the applicant is requested to submit a FCC Form 601. If the link is given a green light, registration is complete. A benefit to having the preceding steps completed first is that fewer users will be accessing the NTIA database simultaneously thereby easing server hardware requirements. Also, fewer

NTIA database queries have the positive side effect of improved protection of the location of classified Federal government links.

- **Filing FCC Form 601 Applications:** When required to file individual Form 601 applications for a link, the user may instruct the software to file the Form 601 applications directly through batch filing to the FCC ULS system, or the user may choose to independently file the applications by going to the FCC ULS interactive web page. The application then goes through the existing FCC and IRAC coordination and licensing processes.

- **Registration Complete:** The user is provided with a certification of registration that contains administrative information and notifies the licensee about the applicable construction deadline. We propose a revised construction period of 6 months rather then the 12 months adopted in the R&O.

10. Summary

The Commission's Report and Order in WT Docket No. 02-146 outlines a new spectrum management approach for the 70 – 90 GHz bands. The new streamlined process involves blanket licensing, electronic coordination with the federal government, and industry link registration. This innovative licensing and registration approach represents a seminal moment in spectrum management. The Commission is implementing a groundbreaking spectrum management process that incorporates the best that industry and government have to offer – a streamlined licensing and industry device

registration process using state-of-the art software and harnessing the power of the Internet.

Comsearch has invested significant resources over the past two years working closely with industry and government stakeholders to develop a licensing and registration process for the 70 – 90 GHz bands that is as efficient as possible.

We are excited about the prospects for this new spectrum management regime and believe it holds great promise for other bands as well. Based upon our experience and resources, we are highly qualified and capable to perform the duties and responsibilities of Database Manager for the 70 – 90 GHz bands.

Respectfully Submitted,
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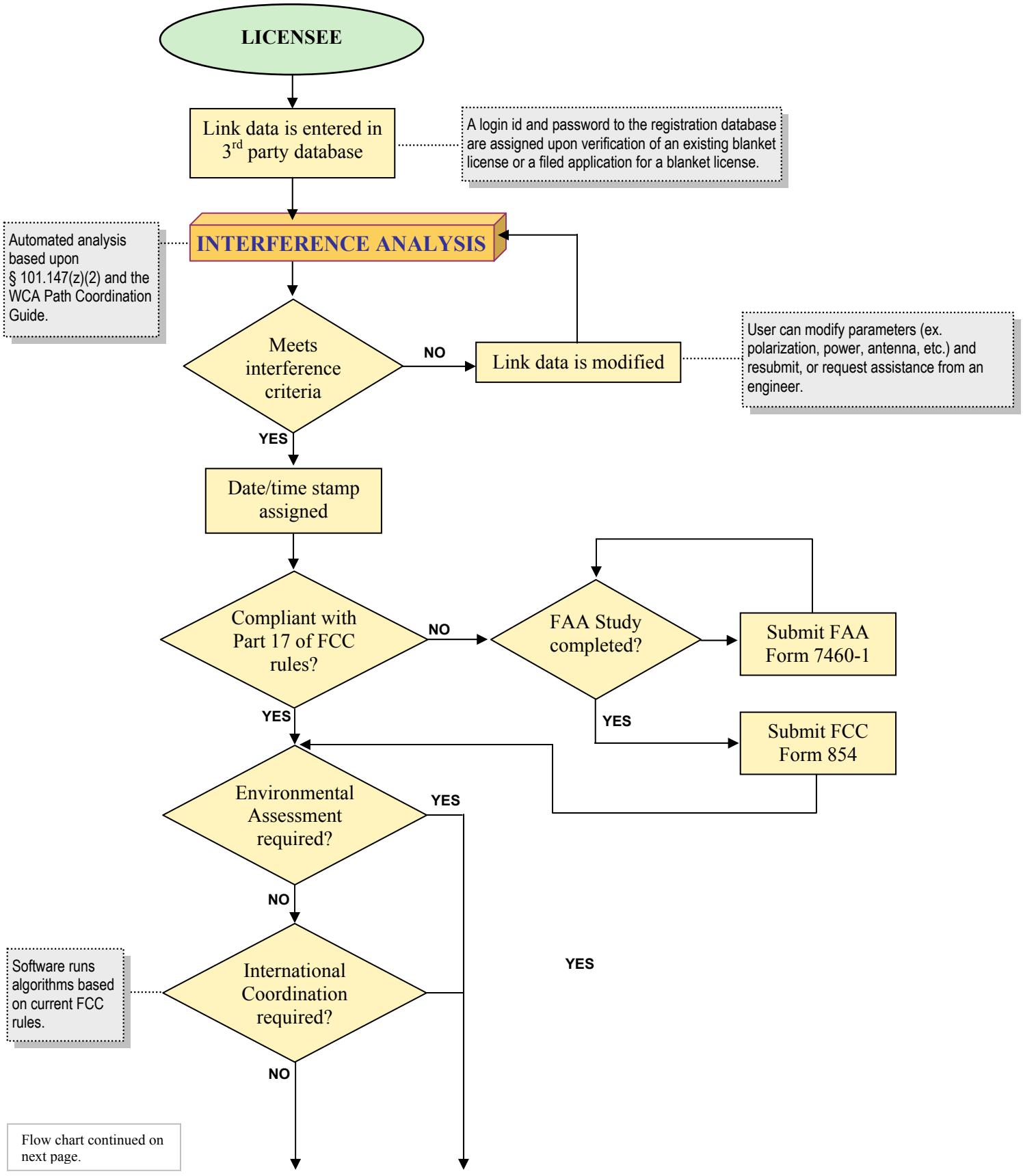
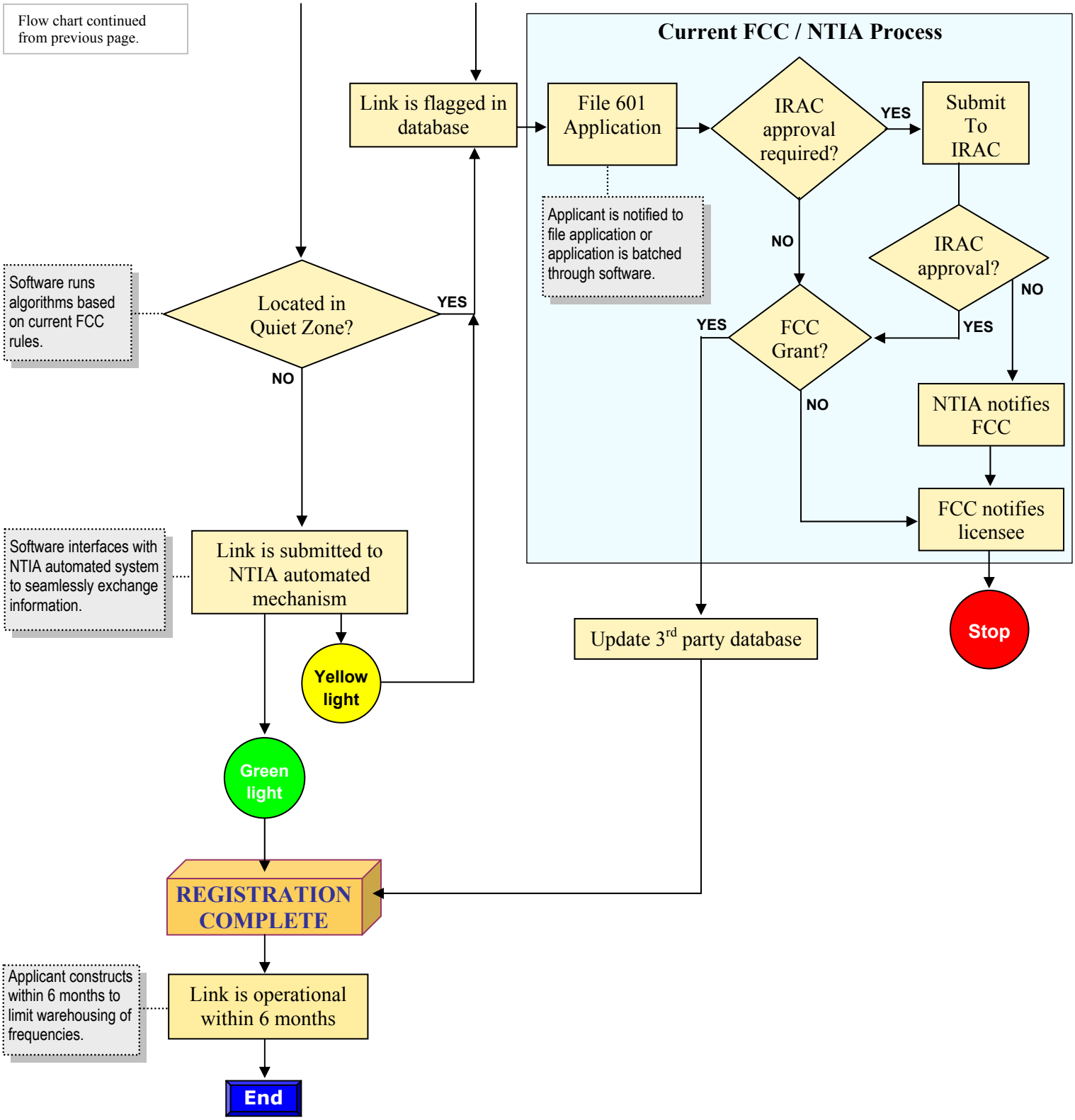
Date: March 26, 2004

Attachment 1: Vision for 70-90 GHz Link Registration and Interference Harmonization

Created by Comsearch — March 26, 2004




Flow chart continued from previous page.
Current FCC / NTIA Process
Link is flagged in database
File 601 Application
IRAC approval required?
YES
Submit To IRAC
Applicant is notified to file application or application is batched through software.
NO
IRAC approval?
NO
YES
YES
FCC Grant?
NO
NTIA notifies FCC
FCC notifies licensee
Stop
Software runs algorithms based on current FCC rules.
Located in Quiet Zone?
YES
NO
Software interfaces with NTIA automated system to seamlessly exchange information.
Link is submitted to NTIA automated mechanism
Yellow light
Update 3rd party database
Green light
REGISTRATION COMPLETE
Applicant constructs within 6 months to limit warehousing of frequencies.
Link is operational within 6 months
End